REMARKS

Favorable consideration and allowance are respectfully requested for claims 26-45 in view of the foregoing amendments and the following remarks.

Drawing Objections

A new drawing, Figure 4b, is provided by this amendment. This drawing shows an arrangement for a hydrogen generating device with a nitrogen oxide reduction reactor. The specification has been amended to describe this figure, in particular on pages 5 and 8-9. Support for these changes can be found in the specification, for instance in the paragraph bridging pages 2 and 3.

Figure 4 has been renumbered Figure 4a, and the feed device 46 is shown. Support for this change can be found in the specification, for instance in lines 8-12 of page 10.

Accordingly, withdrawal of the objections to the drawings for failure to show every feature of the invention specified in the claims is respectfully requested.

In view of the comment in the Office Action requesting that Applicant ensure the drawings and specification reflect the same reference signs, Applicant has reviewed these documents and believes the drawings to be in proper form.

Specification Objections

The specification has been amended to replace "hydrocarbons" with "methanol or other hydrocarbons" on page 7, line 15. Methanol is a species of the genus hydrocarbons, and while methanol is mentioned as a hydrocarbon suitable for use with the reactor, other hydrocarbons would be similarly suitable.

On page 8, line 13, the phrase "or electrical heater" has been added before "20" and "2" has been replaced with "12" in line 16 on that same page, as suggested in the Office Action.

On page 10, line 16, "or main reaction stage" has been added before "32", as suggested in the Office Action.

Claim Rejections

The rejection of claims 26-45 under 35 U.S.C. § 112, first paragraph as not properly supported in the phrase "so as not to be in thermal contact with the exhaust stream of the motor vehicle" is respectfully traversed.

First, it is important to consider that the law does not require word-for-word copying of claim language in order for a claim to be properly supported. As articulated by the Federal Circuit Court of Appeals, *ipsis verbis* disclosure is not necessary to satisfy the written description requirement of section 112. Instead, the disclosure need only reasonably convey to persons skilled in the art that the inventor had possession of the subject matter in question. *In re Edwards*, 568 F.2d 1349, 1351-52, 196 U.S.P.Q. 465, 467 (CCPA 1978), See also *Fujikawa v.*

Wattanasin, 93 F.3d 1559, 39 U.S.P.Q.2d 1895 (Fed. Cir. 1996). In other words, the question is whether the application provides adequate direction to reasonably lead persons skilled in the art to the claimed subject matter. See *In re Edwards* at 1352, 196 U.S.P.Q. at 467.

Second, the Patent and Trademark Office has the initial burden of presenting evidence or reasoning to explain why persons skilled in the art would not recognize a description of the claimed invention in the original disclosure. See the Manual of Patent Examining Procedure, Section 2163(II)(A)(3)(b), U.S. Department of Commerce, Patent and Trademark Office, Eighth Edition, August 2001. This burden has clearly not been met. To date, the only evidence or reasoning in the record is a conclusory statement offered in the recent office action that the cited claim limitation "is nowhere disclosed in the original specification." This assertion is provided without any support or explanation, and can certainly not be said to meet the requirement of explaining why a person skilled in the art would not recognize a description of the claimed invention in the original disclosure.

Finally, reviewing the specification as a whole, it is clear that the Applicants had possession of the invention as claimed. The specification provides numerous instances which show that the inventors contemplated that the hydrogen generating device would not be in thermal contact with the exhaust stream of the motor vehicle. For instance, consider the text on page 3, lines 19-22, which explains that the device for generating hydrogen gas includes an

adjustable heating device which can bring a catalyst to a predetermined temperature. Moreover, the express language of the specification indicates that the device can bring the catalyst to the predetermined temperature independently of the hot engine exhaust. Thus, one of skill in the art would clearly understand that the catalyst is thermally independent of the exhaust stream of the motor vehicle.

The specification explains an advantage of the inventive device being the ability to regulate the catalyst temperature flexibly and independently of the engine. Further the language contrasts the disadvantage of known devices which heat the catalyst using hot engine exhaust. The device of the present invention provides a way to avoid damage to the catalyst (deactivation) that can be caused by the constant heating by the exhaust stream while the engine is operated after heating (and even further damage caused when the engine overheats). See page 2, lines 8-18 and page 4, lines 1-12 of the specification.

Thus, one of skill in the art would clearly understand that it is useful to avoid heating the catalyst with the engine exhaust. In order to avoid heating the catalyst of the hydrogen generating device with the engine exhaust, the catalyst must not be in thermal contact with the motor vehicle's exhaust stream. Other instances in the specification clarifying that the inventors contemplated that the device for generating hydrogen gas would be thermally independent of the exhaust stream include page 8, at lines 15 (teaching that different stages of the device may be heated independently) and 18-19 (teaching that some stages may

not be heated at all); page 10 and lines 20-21 (also teaching that some stages may not be heated at all; and page 11, line 13 (teaching that the reactor may be provided thermal insulation). While the latter teaching is directed toward thermal insulation to avoid internal heat loss, such insulation, in all likelihood, would also avoid heat gain from any external sources (consider the walls of an ice-chest, which are configured to avoid internal heat gain from external sources).

In view of the foregoing, it is clear that the inventors contemplated a system where the hydrogen generating device is thermally independent of the exhaust stream of the motor vehicle. Accordingly, the limitation in claims 26 and 45 that the hydrogen generating device is not in thermal communication with the exhaust stream of the motor vehicle is properly supported by the specification and does not present any new matter. The written description requirement is satisfied for these claims. Reconsideration and withdrawal of this rejection are respectfully requested.

The rejection of claims 33 and 38 under 35 U.S.C. § 112, second paragraph as indefinite is respectfully traversed.

Claim 33 depends from claim 31 which depends from claim 26. Claim 33 recites, in part, a water vapor reformation reactor with various stages. Means are provided for independently heating the evaporation stage, the main reaction stage and the aftertreatment stage for water vapor reformation.

Claim 26 recites, in part, a hydrogen generating device which includes one or both of (i) a water vapor reformation reactor and (ii) a partial oxidation reactor. An adjustable heating device is coupled with one or both of the (i) water vapor reformation reactor and (ii) partial oxidation reactor.

Thus, claim 33 clarifies that the hydrogen generating device of claim 26 includes a water vapor reformation reactor and that the water vapor reformation reactor is provided with heater means for its various stages. The requirement of an adjustable heating device in claim 26 does not become less clear or somehow indefinite by the additional limitations provided in claim 33. One of skill in the art would readily be able to determine the scope of claim 33 and the claim is therefore definite. Reconsideration and withdrawal of this rejection are respectfully requested.

Claims 38 and 39 are amended to recite that the CO concentration (of the gas product) is reduced by the aftertreatment stage. Support for this amendment may be found, for instance, in the specification on page 7, at lines 7-11 and the sentence bridging pages 7 and 8. As amended, claim 38 is believed to be definite, and reconsideration and withdrawal of this rejection are respectfully requested.

The rejection of claims 26-45 under 35 U.S.C. § 103 as obvious over EP 537,968 (Oshima et al.) in view of U.S. 1,789,812 (Frazer) is respectfully traversed.

The Office Action indicates that the claims were not examined as they were presented to the USPTO. Rather, they were examined without giving consideration to the limitation of claims 26 and 45 that the hydrogen generating device is not in thermal contact with the exhaust system of the motor vehicle. As set forth above, this claim limitation does not present any new matter, as the specification clearly shows that the inventors contemplated a system where the hydrogen generating device is thermally independent of the exhaust system of the motor vehicle.

EP '968 (Oshima et al.) provides no teaching or suggestion to try to heat the hydrogen generating device independently of the exhaust system of the motor vehicle. As indicated in the Office Action, the hydrogen generating device 102 of the reference, is arranged to surround the exhaust pipe of the motor vehicle. This is so that the heat from the exhaust may heat the hydrogen generating device.

The '812 patent (Frazer) is cited as teaching that a catalyst may be heated by gas or electric heater or both. The patent relates to an apparatus for eliminating combustible components from the exhaust of an internal combustion engine. This apparatus does not provide for a hydrogen generating device. Not only is the device of Frazer not used in conjunction with the formation of hydrogen gas, as is required by the present claims, the device of Frazer is heated directly by the exhaust stream of the engine. This is clear from the disclosure which indicates that the device directly contacts the engine exhaust gas. See

page 2, col. 1, lines 36-42. The device is therefore in direct thermal communication with the exhaust stream of the engine. The Examiner's attempt to combine Frazer and Oshima must fail since it amounts to impermissible hindsight to state it would be obvious to arrive at the presently claimed invention. There is no disclosure in either Frazer or Oshima to provide any form of heating, electrical or otherwise, that is separate from the heating provided by the exhaust stream. As explained above, Oshima teaches a device where the exhaust stream is used for heating. Frazer teaches a device where both the exhaust stream and an electrical heater are used for heating. There is simply no disclosure in the cited references to separate the heating from the exhaust stream.

These references fail to teach or suggest a nitrogen oxide reduction reactor where hydrogen is generated by a hydrogen gas generating device which is not in thermal contact with the exhaust system of the motor vehicle. Accordingly, reconsideration and withdrawal of this obviousness rejection are respectfully requested.

CONCLUSION

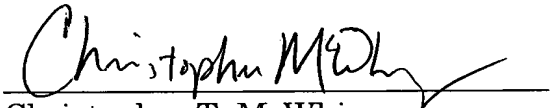
In view of the foregoing, the application is respectfully submitted to be in condition for allowance, and prompt favorable action thereon is earnestly solicited.

If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #011210.42636CO).

Respectfully submitted,

December 14, 2004



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